UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/569,002	02/15/2006	Mitsuhiro Kashiwabara	112857518	1753

29175 7590 11/30/2009

K&L Gates LLP
P. O. BOX 1135
CHICAGO, IL 60690

EXAMINER	
HOLLWEG, THOMAS A	
ART UNIT	PAPER NUMBER
2879	

NOTIFICATION DATE	DELIVERY MODE
11/30/2009	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

chicago.patents@klgates.com

Office Action Summary	Application No.	Applicant(s)	
	10/569,002	KASHIWABARA, MITSUHIRO	
	Examiner	Art Unit	
	Thomas A. Hollweg	2879	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 August 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *11,12,14-18 and 20-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *11,12,14-18 and 20-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *15 February 2006* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Acknowledgment of Amendment

1. Applicant's Amendment of August 12, 2009, is acknowledged. No claims are canceled. Claims 22 and 23 are added. Claims 11, 12, 14-18 and 20-23 currently pending.

2. The amendment to claim 16 is acknowledged, and the objection is withdrawn.

Drawings

3. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the anode/blue/green/red/cathode arrangement of claim 23 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

4. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New

Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

5. The following claims are objected to because of informalities:

a. Claim 20, "the blue light emitting light layer" **in line 21** of the currently amended claim, lacks antecedent basis.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 11, 12, 14-18 and 20-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamazaki, U.S. Patent Application Publication No. 2001/0031509 A1, in view of Kobori et al., U.S. Patent No. 6,285,039 B1.

8. **With regard to claim 11,** in figures 4, 5A and 5B, Yamazaki discloses an organic EL device comprising: a plurality of light emitting layers (309a-c) including a red light emitting layer (309a), a green light emitting layer (309b), and a blue light emitting layer (309c) laminated in respective order between an anode (303) and cathode (306) (light emitting layers are doped with fluorescent substances [0040], the three colors can be arranged in any order as long as the band structure is maintained [0073]); and an

intermediate layer (402) comprised of an organic material provided in at least one location between the light emitting layers (309a-c), said intermediate layer (402) having an electron blocking property and a hole transporting property [0044-0045], see [0070-0073].

9. It is noted that layer 402, as shown in figure 4, has the effect of raising the HOMO [0044], and the region 503/504, as shown in figure 5A, also has the effect of raising the HOMO [0052]. However, in figure 4, layer 402 is shown closest to the cathode 306, and in figure 5A, region 503/504 is shown closest to the anode 105. Therefore, figures 4 and 5A show slightly different embodiments of the Yamazaki invention [0011-0012].

10. Yamazaki does not expressly disclose that the green light emitting layer comprises a hole transporting material and an electron transporting material.

11. Kobori, in figure 1, teaches an organic EL device having a green light emitting layer (5) comprising a hole transporting material and an electron transporting material (col. 19, lines 38-65; col. 33, line 37).

12. At the time of invention, it would have been obvious for a person having ordinary skill in the art to construct the Yamazaki organic EL device where the green light emitting layer has a hole transporting property and an electron transporting property, as taught by Kobori, because a layer with these materials will be effective at recombining holes and electrons, are stable and will produce high fluorescence intensity (col. 19, lines 60-65).

13. **With regard to claim 12,** in figures 4, 5A and 5B, Yamazaki discloses that a HOMO-LUMO energy gap of the intermediate layer (402, 503/504) is greater than a HOMO-LUMO energy gap of at least one material constituting the light emitting layers (309) disposed adjacent to the intermediate layer (402) (shown in fig. 5A) [0050-0054, 0070-0073].

14. **With regard to claim 14,** in figure 4, Yamazaki discloses that the intermediate layer (402) is provided at least between the green light emitting layer (309b) and the blue light emitting layer (309c) (embodiment of figure 4) [0043-0045], thereby restricting the injection of electrons into the green light emitting layer and promoting the injection of holes into the blue light emitting layer.

15. **With regard to claim 15,** in figures 4 Yamazaki discloses that a LUMO energy level of the intermediate layer (402, 503/504) having a hole transporting property is higher than a LUMO energy level of an electron transporting component in the green light emitting layer (309b) (shown in fig. 5A) [0050-0054].

16. **With regard to claim 16,** in figures 5A and 5B, Yamazaki discloses that the intermediate layer (503/504) is provided at least between the red light emitting layer and the green light emitting layer (embodiment of figure 5A) [0050-0054], thereby restricting the injection of electrons into the green light emitting layer and promoting the injection of holes into the blue light emitting layer.

17. **With regard to claim 17,** in figures 5A and 5B, Yamazaki discloses that a LUMO energy level of the intermediate layer (503/504) having a hole transporting property is

higher than a LUMO energy level of an electron transporting component in the red light emitting layer (shown in fig. 5A) [0050-0054].

18. **With regard to claim 18,** in figures 4, 5A, 5B and 8A, Yamazaki discloses a display [0075] comprising a color filter [0040] on a light take-out side of an organic EL device comprising: a plurality of light emitting layers (309a-c) including a red light emitting layer (309a), a green light emitting layer (309b), and a blue light emitting layer (309c) laminated in respective order between an anode (303) and cathode (306) (light emitting layers are doped with fluorescent substances [0040], the three colors can be arranged in any order as long as the band structure is maintained [0073]); and an intermediate layer (402) comprised of an organic material provided in at least one location between the light emitting layers (309a-c), said intermediate layer (402) having an electron blocking property and a hole transporting property thereby restricting the injection of electrons into the green light emitting layer (309b) and promoting the injection of holes into the blue light emitting layer (309c) [0044-0045], see [0070-0073].

19. Yamazaki does not expressly disclose that the green light emitting layer comprises a hole transporting material and an electron transporting material.

20. Kobori, in figure 1, teaches an organic EL device having a green light emitting layer (5) comprising a hole transporting material and an electron transporting material (col. 19, lines 38-65; col. 33, line 37).

21. At the time of invention, it would have been obvious for a person having ordinary skill in the art to construct the Yamazaki organic EL device where the green light emitting layer has a hole transporting property and an electron transporting property, as

taught by Kobori, because a layer with these materials will be effective at recombining holes and electrons, are stable and will produce high fluorescence intensity (col. 19, lines 60-65).

22. **With regard to claim 20,** in figures 4, 5A and 5B, Yamazaki discloses an organic EL device comprising: an anode (303); a hole transport layer (308) formed on the anode (303); a plurality of light emitting layers (309) including a red light emitting layer (309a), a green light emitting layer (309b), and a blue light emitting layer (309c) laminated in respective order (light emitting layers are doped with fluorescent substances [0040], the three colors can be arranged in any order as long as the band structure is maintained [0073]) on the hole transport layer (308) such that the red light emitting layer (309a) is formed in contact with the hole transport layer (308); an electron transport layer (310) formed on the blue light emitting layer (309c); a cathode (306) formed on the electron transport layer (310); and an intermediate layer (402) comprised of an organic material provided between the blue light emitting layer (309c) and the green light emitting layer (309b), said intermediate layer (402) having an electron blocking property and a hole transporting property, thereby restricting the injection of electrons into the green light emitting layer (309b) and promoting the injection of holes into the blue light emitting layer (309c), wherein the red light emitting layer (309a) is configured so that a portion of the holes injected through the hole transfer layer (308) are re-coupled in the red light emitting layer (309a) to give red light emission and a remainder of the holes are transported into the green light emitting layer (309b), wherein the green light emitting layer (309b) has a hole transporting property and an electron transporting property,

such that some of the holes transferred from the red light emitting layer (309a) are re-coupled in the green light emitting layer (309b) to give green light emission and the remainder of the holes are transported into the blue light emitting layer (309c), and such that some of the electrons injected from the blue light emitting layer (309c) contribute to green light emission and the remainder of the electrons are transported to the red light emitting layer (309a) [0031-0035, 0040, 0044-0045, 0070-0073].

23. Yamazaki does not expressly disclose that the green light emitting layer comprises a hole transporting material and an electron transporting material.

24. Kobori, in figure 1, teaches an organic EL device having a green light emitting layer (5) comprising a hole transporting material and an electron transporting material (col. 19, lines 38-65; col. 33, line 37).

25. At the time of invention, it would have been obvious for a person having ordinary skill in the art to construct the Yamazaki organic EL device where the green light emitting layer has a hole transporting property and an electron transporting property, as taught by Kobori, because a layer with these materials will be effective at recombining holes and electrons, are stable and will produce high fluorescence intensity (col. 19, lines 60-65).

26. **With regard to claim 21,** in figure 4, Yamazaki discloses that the organic material for the intermediate layer (402) includes at least one of TPD and CPB [0071].

27. **With regard to claim 22,** in figures 4, 5A and 5B, Yamazaki discloses that the HOMO-LUMO energy gap of the intermediate layer (402) is greater than a HOMO-LUMO energy gap of all of the materials constituting the light emitting layers disposed

adjacent to the intermediate layer (402) (when the appropriate materials are selected from those listed [0070-0073]).

28. **With regard to claim 23,** in figures 4, 5A and 5B, Yamazaki discloses an organic EL device comprising: a plurality of light emitting layers (309a-c) including a blue light emitting layer (309a), a green light emitting layer (309b), and a red light emitting layer (309c) laminated in respective order between an anode (303) and cathode (306) (light emitting layers are doped with fluorescent substances [0040], the three colors can be arranged in any order as long as the band structure is maintained [0073]); and an intermediate layer (401) comprised of an organic material provided in at least one location between the light emitting layers (309a-c), said intermediate layer (401) having a hole blocking property and an electron transporting property [0044-0045], see [0070-0073].

29. Yamazaki does not expressly disclose that the green light emitting layer comprises a hole transporting material and an electron transporting material.

30. Kobori, in figure 1, teaches an organic EL device having a green light emitting layer (5) comprising a hole transporting material and an electron transporting material (col. 19, lines 38-65; col. 33, line 37).

31. At the time of invention, it would have been obvious for a person having ordinary skill in the art to construct the Yamazaki organic EL device where the green light emitting layer has a hole transporting property and an electron transporting property, as taught by Kobori, because a layer with these materials will be effective at recombining

holes and electrons, are stable and will produce high fluorescence intensity (col. 19, lines 60-65).

Response to Arguments

32. All of applicant's arguments have been considered, but are moot in view of the new grounds for rejection.

Conclusion

33. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

34. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

35. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thomas A. Hollweg whose telephone number is (571) 270-1739. The examiner can normally be reached on Monday through Friday 7:30am-5:00pm E.S.T..

36. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh Patel can be reached on (571) 272-2457. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

37. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/TH/

/NIMESHKUMAR D. PATEL/
Supervisory Patent Examiner, Art Unit 2879